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Pat Simpson

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	Examiner: H. Wilkins, III
Amitava Guha and William D. Nielsen, Jr.)	
)	Art Unit: 1742
Serial No.: 09/387,894)	
)	
Filed: September 1, 1999)	
)	
For: IMPROVED DIES FOR DIE)	Attorney Docket No.: 20721/04404
CASTING ALUMINUM AND)	
OTHER METALS)	
)	

Assistant Commissioner for Patents
Washington, D.C. 20231

REQUEST FOR RECONSIDERATION

Dear Sir:

In response to the Office Action of March 4, 2002, please reconsider the patentability of the above-identified application for the following reasons:

Claims 28, 12 and 29 to 31

It's hard to imagine a clearer case of a hindsight rejection than presented here.

Basically, the Examiner has done no more than paraphrase Applicants' own explanation of why the invention works when he explains why the present invention is obvious. See the first paragraph on page 3 of the Office Action of March 4, 2002. He has, however, totally failed to provide any explanation of (1) how the prior art would motivate one of ordinary skill in that art to do what Applicants have done, and (2) why one of ordinary skill in the art would expect the unique results Applicants found.

Thus, the Examiner totally fails to explain how one of ordinary skill in the art, desirous of improving on the performance of the material commonly used for making mold parts for metal molding, H13 tool steel, would be led to reject this steel altogether and instead select Ni-Be alloys in its stead. See the bottom of page 1 of the specification.

The Federal Circuit has made abundantly clear that all prior art must be considered in assessing obviousness, not just the prior art favorable to the Examiner. See MPEP §2141.02, last subsection. Here, an important difference between the present invention and the most pertinent prior art is that underaged Ni-Be alloys are used in lieu of H13 tool steel in making mold parts for metal molding. The Examiner's refusal to consider this prior art when he assesses obviousness makes this rejection fatally defective for this reason alone.

A second reason why this rejection is fatally defective is that the Examiner has used Applicants' own scientific explanation of why the invention works as his justification for the motivation demanded by the Federal Circuit. Thus, the Examiner explains that the known aging response of Ni-Be alloys, as exemplified in Figure 1 of the specification, would have led a person of ordinary skill in the art to expect increased useful life from a tool made from a Ni-Be alloy which has been underaged.

However, the aging curve of Figure 1 shows how hardness varies as a function of time at constant aging temperature. In other words, Figure 1 shows the influence of aging time on an Ni-Be alloy which is heated up once to fixed aging temperature and then held at that temperature before being allowed to cool. In complete contrast, the mold parts which are aged through use in the present invention are repeatedly heated to molding temperatures and then cooled, over and over again for thousands and thousands of cycles. Nothing in the prior art fairly ties the single-shot aging curve of Figure 1 with what occurs during conventional metal molding in which the same mold is reused over and over again for thousands and thousands of cycles. Accordingly, one skilled in the art could not have reasonably predicted that a mold made from an underaged Ni-Be alloy would grow stronger and harder over time as a result of constant and repeated use and reuse during metal molding, as the Examiner asserts.

Another fundamental flaw in this rejection relates to molding temperature. The Harkness et al. article does indeed disclose that Ni-Be alloys can be underaged. In addition, this article, in an unrelated disclosure, also indicates that the Ni-Be alloys described in that article can be used to make mold parts for molding plastic components. The Examiner combines these two

unrelated teachings on the theory that it would be obvious to select Harkness' underaged alloy for making Harkness' mold parts with the reasonable expectation that such alloys would further age harden from repeated reuse during the molding operation.

However, most plastics are molded at much lower temperatures than the temperatures at which metals are molded and the temperatures at which Ni-Be alloys age harden, as many plastics decompose at these higher temperatures. Accordingly, it would not be obvious to make Harkness's mold parts for plastic molding from underaged Ni-Be alloys because the lower molding temperatures encountered during plastics molding would be too low to cause age hardening of these alloys to any significant degree. It is only because molten metals are molded by the inventive process that significant additional age hardening occurs. However, the Harkness article does not fairly suggest molding metals, and therefore this reference would not motivate one skilled in the art to make mold parts from underaged Ni-Be alloys, since there would be no apparent purpose or advantage of doing so.

In short, the known aging curves of Ni-Be alloys are simply irrelevant to the Ni-Be mold parts disclosed in Harkness, since the temperatures at which these parts will be used during plastics molding are below those contemplated in these curves. Therefore, it is clear that the combination of the disclosures in Harkness relating to mold parts and underaged alloys as done in this rejection is based on a hindsight reconstruction of the prior art – not a reasonable assessment of what the prior art fairly suggests.

Claims 28, 12 and 29 to 31 are directed to a process for molding a molten metal using mold parts made from an underaged Ni-Be alloy. Taken as a whole, the prior art does not fairly suggest replacing the H13 tool steel mold parts normally used for this purpose with mold parts made from this particular alloy. Nor does the prior art suggest the significant enhancement in tool useful life Applicants found by making this modification. Accordingly, the present invention as recited in these claims is unobvious and patentable over the cited references.

Claims 2 and 32 to 34

These claims are directed to a mold or mold insert to be used for molding molten metal. These claims are also rejected based on the combination of the unrelated teachings in the Harkness et al. article relating to (1) using Ni-Be alloys to make mold parts for plastic molding, and (2) the fact that Ni-Be alloys can be underaged, if desired.

As indicated above, there would be no advantage apparent from the Harkness et al. article in making the mold parts disclosed therein from underaged alloys, because the temperatures encountered when such mold parts are used for plastics molding are significantly below the temperatures which would effect age hardening. Accordingly, the rejection of these claims is also improper as being based on a hindsight reconstruction of the prior art.

Claims 1, 3, 5 to 10 and 24 to 27

These claims are directed to a tool made from an underaged Ni-Be alloy.

Like the rejections discussed above, this rejection is also improper as being based on a hindsight combination of same two unrelated teachings in the Harkness et al. article discussed above.

Furthermore, the essence of this rejection is that, given the desire to build a tool having a particular combination of properties, the prior art would enable one of ordinary skill in the art to reach that combination. The error in this approach is that it wholly fails to explain why a person of ordinary skill in the art would desire to build a tool having the properties of an underaged Ni-Be alloy. In other words, it is not enough that the prior art empower one of ordinary skill in the art to achieve a particular purpose if he so chooses. Rather, the prior art must also motivate one skilled in the art to achieve that purpose.

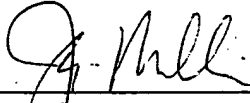
Here, no purpose or advantage is suggested in Harkness et al. for building a tool with the properties of an underaged Ni-Be alloy. Accordingly, nothing in the prior art would motivate a person of ordinary skill in the art to modify the prior art to do what Applicants have done. Therefore, it is clear that the prior art fails to make a prima facie case of obviousness with respect to the subject matter of these claims as well.

Finally, an important feature of the present invention, as indicated above and described in connection with Figures 2 and 3 of the specification, is that the useful lives of tools coming into repeated contact with molten metal can be significantly extended. As further discussed above, the Examiner's assertion that this result would have been expected based on the known aging curves of Ni-Be alloys is simply not well taken. Therefore, these claims are unobvious and patentable for the further reason that an unexpected result has been shown. See, In re Papesch, 50 CCPA 1084, 315 F.2d 381, 137 USPQ 43 (1963) (Unexpected advantages of an invention are part of the "invention as a whole" under 35 USC §103.).

If any fee is due with this amendment, please charge our deposit account No. 03-0172.

Respectfully submitted,

Date: July 2, 2002



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